

question of post-operative pregnancy was studied as carefully as our records permitted but we are unable to give any light on this subject. Sixteen reported pregnant, but of these three only had living children; 4 developed ectopic gestation; 2 had miscarriages; 6 were too early in pregnancy at the time of examination to be sure of the result. Forty per cent of our series returned and were judged as giving satisfactory results. A further 20 per cent were considered satisfactory but with complaints of a minor character; 18 per cent were not traceable; 13 per cent were re-admitted for one complaint or another, usually of a pelvic nature. Ten per cent were uncoöperative and no post-operative records were made.

CONCLUSIONS

Salpingitis is a serious disease. Its diagnosis is not easy and treatment requires much surgical skill and judgment. Acute cases should never be operated upon. There should practically be no mortality in chronic cases. The end results are fairly good, considering the nature of the disease and the many complicating factors.

LUNG ABSCESS

SOME ASPECTS OF ETIOLOGY AND MEDICAL TREATMENT *

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ETIOLOGY

The generally accepted idea of the etiology of pulmonary suppuration has been that it follows certain cases of pneumonia in which, because of certain conditions in the lung little understood, necrosis and suppuration result instead of the more usual process of resolution.

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Certain etiological factors have been recognized as especially favoring the development of pulmonary suppuration, such as the inhalation of foreign bodies, operations upon the respiratory tract, especially tonsillectomy and the extraction of teeth, and less frequently following operations upon suppurative foci in more distant parts of the body. In all of these conditions the conception has been that pneumonia first occurred and that then later following the pneumonia there was suppuration.

Dr. Adrian Lambert and I in studies of a considerable series of abscess of the lung were impressed by the fact that a very considerable percentage of the cases apparently occurred without any evidence of either pneumonia or of any of the predisposing factors above mentioned. The fact, also, that in cultures made from these lung abscesses very frequently none of the ordinary pathogenic bacteria could be found, although the abscesses swarmed with anaerobic bacteria, led us to suspect that possibly the anaerobic organisms played a real pathogenic role in the formation of the abscess instead of simply the secondary one which had been ascribed to them.

It is significant also that the anaerobes found in abscesses correspond to a group frequently found in persons with bad oral hygiene, particularly diseased tonsils and pyorrhea alveolaris.

Since that time a considerable amount of experimental evidence concerning the role of anaerobes in the formation of abscesses has been elicited. Klein and Smith have produced pulmonary abscesses in animals by intratracheal injections of the scrapings from infected teeth.

Crowe and Scarf injected the sinuses of dogs with such scrapings and obtained abscesses of the lung in two out of six cases.

Fetteroff and Fox found infected emboli in the bed of removed tonsils.

Cutler and Schlueter were able to produce pulmonary abscesses by placing emboli infected with anaerobes in the jugular vein of animals.

From these experiments it would appear that abscess of the lung may be produced either by inhalation of infection or through the blood stream by embolus from more distant parts of the body. It also appears to be proved that the anaerobic bacteria frequently found in the mouth will produce abscesses of the lung experimentally under certain conditions.

The anaerobes which have been found most commonly, both in dirty mouths and in abscesses of the lungs, are some of the spirochaetes, fusiform bacilli, vibrios, motile bacilli of the colon group and anaerobic streptococci.

The important practical application of these newer ideas of the possible role of the anaerobe in the production of pulmonary abscess is the fact that operative procedures, especially tonsillectomy and tooth extraction in the mouths of persons with poor oral hygiene, produce ideal conditions for the transmission of these organisms to the lungs and point to the extreme importance of cleaning up the mouth very carefully prior to any such operation. It would appear that as a preventive procedure this is most important and is probably more so than the much discussed problem of the relative danger of local and general anaesthesia for such operations.

MEDICAL TREATMENT

Early abscess of the lung should be considered primarily as a medical disease. Chronic pulmonary abscess usually calls for surgery.

REST AND POSTURE

It is our experience that rest, combined with proper postural treatment, is the best method to be employed first in the treatment of early pulmonary abscess. From forty-five to fifty per cent of early abscesses recover by this means alone. It has long been known that a certain number of abscesses of the lung cure themselves completely by spontaneous rupture and evacuation. It is the object

of this medical treatment by rest and posture to increase the number of such cures and the advantage to the patient of avoiding operation with a very long convalescence and frequent surgical dressings, to say nothing of the danger of the operation itself, is very evident.

We have also found that surgical operation during the acute phases of abscess of the lung carries with it a very high mortality, sixty-five to seventy per cent. By careful frequent x-ray examinations we believe it is possible to gauge the point when this acute inflammation about the abscess is subsiding and when such x-ray studies are associated with frequent surgical consultation, as they should be, it is usually possible to judge of the phase of the disease in which operation can be performed with the least risk and with the best hope of success.

On the other hand, if the lung lesion does not clear up satisfactorily after one or two months of this conservative treatment, we have found that it probably will not and that then surgery should be called upon. If this medical treatment is persisted in too long, the case drifts into the chronic stage and operation then again becomes more dangerous and complete cure is less apt to occur because of the liability to permanent bronchial fistula or to the failure of the abscess to close completely on account of the rigid fibrous walls which have been allowed to form.

Medical care, therefore, consists mainly in insisting upon rest and postural drainage during the early acute stages, and later consists in the exercise of proper judgment as to whether this treatment alone is likely to succeed, rather than to allow the case to become too chronic and less favorable for the surgical operation which will eventually be necessary.

BRONCHOSCOPY

In association with rest and posture, we have used bronchoscopy as an aid in the treatment of certain cases in order to assist drainage. We usually employ this method in cases which do not respond in a few weeks to

rest and posture alone before resorting to more radical surgery. When foreign-body inhalation is suspected or possible, bronchoscopy is indispensable both for the diagnosis and for the cure by removal of the foreign body.

On the other hand, we believe that the practice of long continued bronchoscopy over many months is mainly palliative and has the same unfavorable effect as does the long-continued medical treatment, allowing the case to become so chronic as to be surgically unfavorable.

ARTIFICIAL PNEUMOTHORAX

Artificial pneumothorax has been advocated by some as an ideal method of treatment for abscesses of the lung. We have used this method in a considerable number of cases and found it very unsatisfactory and sometimes dangerous. If the abscess of the lung is situated near the periphery the introduction of air into the pleural cavity may result in the tearing of adhesions, with the rupture of the abscess into the pleural cavity and the occurrence of a very fulminating empyema, which is generally fatal.

On the other hand, the air introduced by the method of artificial pneumothorax can not be exactly controlled and sometimes it will get in between the lung and the mediastinal pleura, resulting in a cutting off of the drainage rather than in favoring it. We believe that the principle of artificial pneumothorax as it is used in pulmonary tuberculosis is mainly for immobilization of the infected organ. The principle of treatment in pulmonary abscess, on the other hand, is drainage, which is by no means always favored by this method.

SUMMARY

1. Abscess of the lung is frequently caused by the post-operative infection from infected mouths.
2. Cleanliness of the mouth is a very important prophylactic measure in avoiding post-operative pulmonary abscess.

3. The diagnosis of pulmonary abscess is comparatively simple and depends largely upon x-ray evidence.

4. The treatment of acute pulmonary abscess is primarily medical by rest and posture.

5. Bronchoscopy is a valuable aid in some cases and is indispensable in cases due to the inhalation of foreign bodies.

6. Medical treatment and bronchoscopy should not be continued so long that the case becomes chronic.

7. Surgery is necessary in about fifty per cent of the cases and if employed at the favorable stage is not attended with serious risk. It is usually the only treatment for chronic cases.

8. The close coöperation of the nose and throat surgeon, the internist, the surgeon and the bronchoscopist is essential to obtain the best results.